Name_____

Date_____

Advanced Algebra

Unit 3: exponential, Log and Power Functions.

Inverse of Exponential...Log Functions

Assignment #12

Important Log Properties

1) $\log_a(uv) = \log_a u + \log_a v$ Product Property

2) $\log_a \frac{u}{v} = \log_a u - \log_a v$ Quotient Property

3) $\log_a u^n = n \log_a u$ Power property

Class Examples Together:

1) $\log_{10} \frac{2}{3}$ $\log_{10} 2 - \log_{10} 3$

2) $\log_{10} 6$ $\log_{10} 3 + \log_{10} 2$

3) $\log_{10} 9$ $\log_{10} 3^2$

I can Re-write the logarithm of a product

Re-Write $\log_{10} 7x^3$ $\log_{10} 7 + 3\log_{10} x$

I can use log properties to condense a expression

Condense $\log_{10} x - \log_{10} 3$ $\log_{10} \frac{x}{3}$

Condense $\log_{10} 2 - 2\log_{10} x$ $\log_{10}\left(\frac{2}{x^2}\right)$

I can expand a logarithmic Expression

Expand $\log_2 3xy^2$ $\log_2 3 + \log_2 x + 2\log_2 y$

Assignment #12

Classwork: Use the log rules to expand the following expressions

1) $\log_2 3x$

$\log_2 3 + \log_2 x$

2) $\log_8 16x$

$\log_8 16 + \log_8 x$

3) $\log_{10} 2x^3$

$\log_{10} 2 + 3\log_{10} x$

4) $\log_4 \frac{6}{5}$

$\log_4 6 - \log_4 5$

5) $\log_5 9$

$\log_5 3^2$

6) $\log_6 \frac{10}{3}$

$\log_6 10 - \log_6 3$

7) $\log_3 x^3$

$3\log_3 x$

8) $\log_3 6xy$

$\log_3 6 + \log_3 x + \log_3 y$

9) $\log_{10} 7x^3yz$

$\log_{10} 7 + 3\log_{10} x + \log_{10} y + \log_{10} z$

Use the log rules to condense the expression:

1) $\log_5 6 - \log_5 4$

$\log_5 \left(\frac{6}{4}\right)$

2) $\log_3 13 + \log_3 3$ $13 \cdot 3$

$\log_3 39$

3) $2\log_{10} x + \log_{10} 5$

$\log_{10} x^2 + \log_{10} 5$

$\log_{10} 5x^2$

4) $5\log_4 12 - 5\log_4 2$

$\log_4 \frac{12^5}{2^5}$ $\log_4 6^5$

$5\log_4 6$

5) $3\log_3 19 - 3\log_3 38$

$\log_3 \left(\frac{19}{38}\right)^3$ $\log_3 \left(\frac{1}{2}\right)^3$ $\log_3 \frac{1}{8}$

6) $\log_7 48 - 4\log_7 2$

$\log_7 \frac{48}{2^4}$ $\log_7 \frac{48}{16}$ $\log_7 3$

7) $\log_{10} 8 + \log_{10} x + 2\log_{10} y$

$\log_{10} 8xy^2$

8) $\log_{10} 6 - 3\log_{10} \frac{1}{3}$

$\log_{10} \frac{6}{\left(\frac{1}{3}\right)^3}$ $\frac{6}{\frac{1}{27}}$ $\frac{6}{162}$

$\log_{10} \frac{6}{\left(\frac{1}{27}\right)}$

$\log_{10} 162$